

# Deposition of tin(II) sulfide thin films by ultrasonic spraypyrolysis: Evidence of sulfur exo-diffusion

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**Abstract:** Tin Sulfide (SnS) thin films were deposited by ultrasonic spray pyrolysis technique, on glass substrate heated at 280 °C, with different deposition times. The used precursor SnCl<sub>2</sub> and thiourea are dissolved in methanol. X-ray diffraction (XRD) analysis indicates that films are mainly composed with orthorhombic SnS phase at low deposition time. With increasing deposition time, the hexagonal SnS<sub>2</sub> phases become dominant. SnO<sub>2</sub> and metallic Sn phases have been detected with increasing deposition time. Scanning electron microscopy (SEM) observations reveal that films surfaces are rough with the presence of bubbles due to S<sub>2</sub> gas exo-diffusion from the bulk during film growth. A model of S gas formation is presented.

**Keywords :** Tin Sulfide Thin films Spray pyrolysis